

Rainfall_MeteoStation_Myloi_Samos_Rev.02

October 3, 2017

1 Post-processing of the meteorological data

Here we look at the rainfall data obtained from the meteorological station of Myloi

Meteorological station's coordinates

X,Y in EGSA 87
X,Y in WGS 84
Height

```
In [1]: import pandas as pd
        %matplotlib inline
        data = pd.read_csv ('Rainfall_meteostation_Myloi_Samos.csv',
                             header=0,
                             index_col='Year',
                             decimal=',')

        data.head(n=10)
```

```
Out [1]:
```

	01-Sep	02-Oct	03-Nov	04-Dec	05-Jan	06-Feb	07-Mar	08-Apr	\
Year									
1949-50	0.0	37.5	80.0	134.0	107.4	21.5	78.6	62.9	
1950-51	0.0	37.7	101.4	165.1	323.2	153.4	278.8	9.7	
1951-52	4.8	70.7	172.4	155.0	228.0	205.8	171.2	5.6	
1952-53	0.0	53.4	423.1	86.0	559.5	60.0	92.1	18.9	
1953-54	6.2	47.2	103.4	127.7	247.5	119.2	151.4	92.4	
1954-55	1.0	100.0	199.3	204.5	408.4	84.4	56.4	127.4	
1955-56	15.6	207.9	430.0	111.5	128.7	268.8	63.0	19.6	
1956-57	0.0	8.3	53.1	174.9	202.7	30.5	76.9	7.3	
1957-58	8.5	65.5	132.9	51.4	171.3	61.4	145.3	52.2	
1958-59	7.5	24.0	38.9	208.2	221.8	1.5	62.7	6.5	
	09-May	10-Jun	11-Jul	12-Aug	Sum				
Year									
1949-50	57.1	0.0	0.0	0.0	579.0				
1950-51	24.0	0.0	0.0	0.0	1093.3				
1951-52	44.3	0.0	0.0	0.0	1057.8				
1952-53	81.8	6.3	0.0	0.0	1381.1				

1953-54	109.0	0.0	0.0	0.0	1004.0
1954-55	0.0	0.0	0.0	9.6	1191.0
1955-56	5.2	0.0	0.0	0.0	1250.3
1956-57	40.2	0.0	0.0	0.0	593.9
1957-58	4.9	0.0	0.0	0.0	693.4
1958-59	42.8	1.8	11.2	0.0	626.9

In [17]: # Delete the final column (Sum)

```
data_raw = data.loc[:, ['01-Sep', '02-Oct', '03-Nov', '04-Dec', '05-Jan', '06-Feb', '07-Mar']]
data_raw.head(n=45)
```

```
Out[17]:
```

Year	01-Sep	02-Oct	03-Nov	04-Dec	05-Jan	06-Feb	07-Mar	08-Apr	\
1949-50	0.0	37.5	80.0	134.0	107.4	21.5	78.6	62.9	
1950-51	0.0	37.7	101.4	165.1	323.2	153.4	278.8	9.7	
1951-52	4.8	70.7	172.4	155.0	228.0	205.8	171.2	5.6	
1952-53	0.0	53.4	423.1	86.0	559.5	60.0	92.1	18.9	
1953-54	6.2	47.2	103.4	127.7	247.5	119.2	151.4	92.4	
1954-55	1.0	100.0	199.3	204.5	408.4	84.4	56.4	127.4	
1955-56	15.6	207.9	430.0	111.5	128.7	268.8	63.0	19.6	
1956-57	0.0	8.3	53.1	174.9	202.7	30.5	76.9	7.3	
1957-58	8.5	65.5	132.9	51.4	171.3	61.4	145.3	52.2	
1958-59	7.5	24.0	38.9	208.2	221.8	1.5	62.7	6.5	
1959-60	0.0	46.0	121.0	328.1	137.1	44.8	146.2	125.9	
1960-61	1.3	6.5	227.1	337.0	349.1	71.3	44.7	26.3	
1961-62	0.0	36.4	50.9	161.0	126.5	246.1	135.8	31.6	
1962-63	40.0	32.7	237.2	367.5	276.5	201.4	50.2	41.8	
1963-64	0.0	170.6	64.5	47.7	36.1	115.6	25.5	0.0	
1964-65	54.0	0.0	89.8	262.1	143.3	244.2	123.1	179.6	
1965-66	0.0	4.1	65.7	234.1	258.4	101.2	143.9	21.4	
1966-67	5.6	13.2	63.4	326.1	154.9	52.8	40.4	68.9	
1967-68	2.1	115.8	196.9	170.2	269.1	108.8	97.6	0.5	
1968-69	42.0	25.5	143.5	201.9	253.4	138.4	98.2	50.3	
1969-70	0.0	6.5	9.0	408.0	177.5	222.5	103.9	19.5	
1970-71	0.0	65.4	47.5	139.6	191.4	257.1	160.6	19.8	
1971-72	0.0	18.0	90.0	73.6	114.6	79.8	22.5	23.5	
1972-73	2.0	110.3	20.8	32.0	87.0	128.3	21.5	47.2	
1973-74	31.0	28.0	27.7	256.9	37.0	134.5	145.6	19.0	
1974-75	0.0	47.3	202.0	101.0	157.0	96.5	87.3	130.0	
1975-76	0.0	9.5	163.7	141.5	112.0	92.0	65.5	120.0	
1976-77	0.0	131.7	95.3	113.9	194.3	57.4	20.5	26.0	
1977-78	20.5	82.0	126.7	197.5	332.5	258.3	74.5	54.0	
1978-79	147.0	35.5	55.5	100.7	262.9	79.1	42.0	13.5	
1979-80	0.0	67.7	143.0	247.2	147.6	102.0	127.0	64.7	
1980-81	0.0	9.0	70.0	189.7	323.4	121.4	23.0	19.0	
1981-82	0.0	16.8	410.4	347.5	116.4	127.1	155.3	82.3	
1982-83	0.0	50.5	80.4	175.9	90.7	178.6	49.2	14.0	
1983-84	0.0	6.0	222.1	352.0	252.2	285.7	130.5	90.8	

1984-85	0.0	1.0	149.6	176.0	226.3	81.5	139.7	2.0
1985-86	0.0	21.5	47.5	76.1	324.6	158.1	39.0	33.0
1986-87	7.5	24.2	30.5	173.2	157.7	118.5	132.7	56.0
1987-88	0.0	0.0	110.9	68.3	106.0	142.0	220.0	15.5
1988-89	0.0	74.3	150.9	294.3	33.5	21.5	123.6	0.0
1989-90	0.0	143.0	84.0	71.0	3.0	92.0	0.0	57.3
1990-91	11.0	23.5	92.5	368.5	77.5	164.0	74.0	80.5
1991-92	0.0	34.0	97.0	205.5	2.0	63.0	158.0	85.5

	09-May	10-Jun	11-Jul	12-Aug
Year				
1949-50	57.1	0.0	0.0	0.0
1950-51	24.0	0.0	0.0	0.0
1951-52	44.3	0.0	0.0	0.0
1952-53	81.8	6.3	0.0	0.0
1953-54	109.0	0.0	0.0	0.0
1954-55	0.0	0.0	0.0	9.6
1955-56	5.2	0.0	0.0	0.0
1956-57	40.2	0.0	0.0	0.0
1957-58	4.9	0.0	0.0	0.0
1958-59	42.8	1.8	11.2	0.0
1959-60	54.8	0.0	0.0	0.0
1960-61	18.8	5.0	0.0	0.0
1961-62	7.9	1.8	0.0	0.0
1962-63	17.3	0.0	0.0	0.0
1963-64	12.8	0.0	0.0	0.0
1964-65	78.7	0.0	0.0	0.0
1965-66	7.4	3.7	0.0	0.0
1966-67	4.2	0.5	0.0	0.0
1967-68	4.5	2.1	0.0	2.5
1968-69	5.0	2.0	0.0	0.0
1969-70	25.3	1.4	0.0	0.0
1970-71	1.0	2.3	2.0	0.0
1971-72	19.5	0.0	91.3	1.0
1972-73	1.0	0.0	0.0	0.0
1973-74	7.0	0.0	0.0	0.0
1974-75	86.0	56.0	0.0	0.0
1975-76	7.0	6.0	0.0	1.0
1976-77	0.0	22.0	0.0	0.0
1977-78	6.0	0.0	0.0	0.0
1978-79	37.7	0.0	0.0	0.0
1979-80	8.7	1.0	0.0	0.0
1980-81	35.2	0.0	0.0	0.0
1981-82	10.9	14.0	0.0	0.0
1982-83	18.0	0.0	0.0	10.0
1983-84	3.0	0.0	6.0	0.0
1984-85	66.5	0.0	0.0	0.0
1985-86	47.2	2.0	0.0	1.0

1986-87	18.2	0.0	0.0	0.0
1987-88	12.0	0.0	0.0	0.0
1988-89	20.0	5.0	0.0	0.0
1989-90	0.0	2.0	0.0	2.0
1990-91	78.5	0.0	0.0	0.0
1991-92	8.0	NaN	NaN	NaN

In [18]: data_raw.sum(axis=1)

Out[18]: Year

1949-50	579.0
1950-51	1093.3
1951-52	1057.8
1952-53	1381.1
1953-54	1004.0
1954-55	1191.0
1955-56	1250.3
1956-57	593.9
1957-58	693.4
1958-59	626.9
1959-60	1003.9
1960-61	1087.1
1961-62	798.0
1962-63	1264.6
1963-64	472.8
1964-65	1174.8
1965-66	839.9
1966-67	730.0
1967-68	970.1
1968-69	960.2
1969-70	973.6
1970-71	886.7
1971-72	533.8
1972-73	450.1
1973-74	686.7
1974-75	963.1
1975-76	718.2
1976-77	661.1
1977-78	1152.0
1978-79	773.9
1979-80	908.9
1980-81	790.7
1981-82	1280.7
1982-83	667.3
1983-84	1348.3
1984-85	842.6
1985-86	750.0
1986-87	718.5

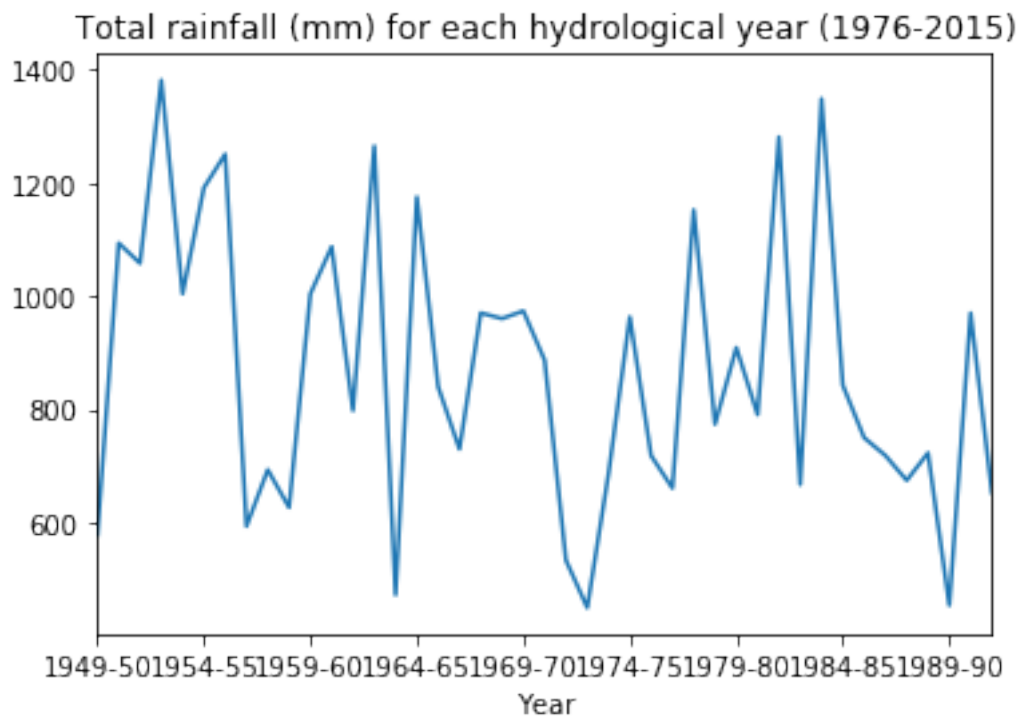
```
1987-88    674.7
1988-89    723.1
1989-90    454.3
1990-91    970.0
1991-92    653.0
dtype: float64
```

```
In [19]: data_raw.sum(axis=1).describe()
```

```
Out[19]: count      43.000000
mean       868.683721
std        251.211903
min        450.100000
25%        680.700000
50%        839.900000
75%       1030.900000
max       1381.100000
dtype: float64
```

```
In [23]: # Figure of the average rainfall per month
data_raw.sum(axis=1).plot(title = 'Total rainfall (mm) for each hydrological year (19
```

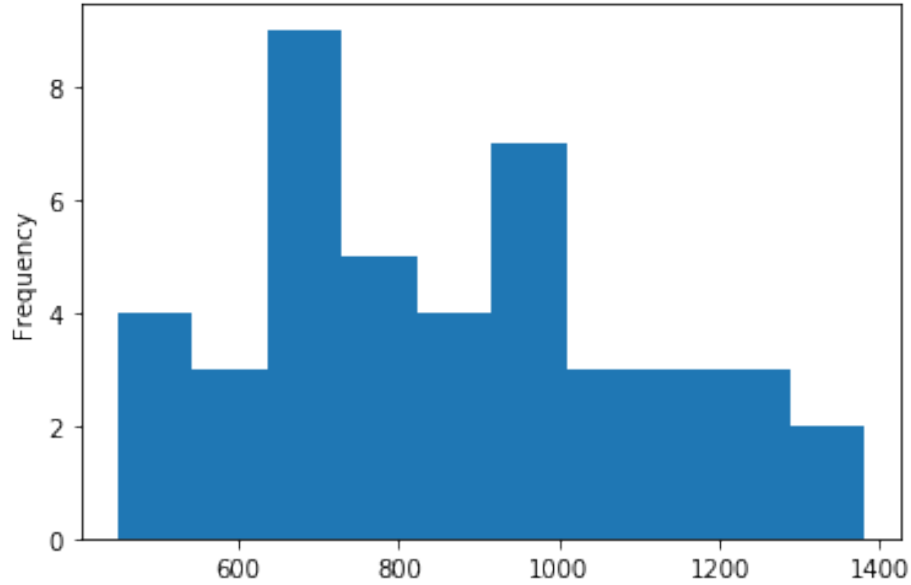
```
Out[23]: <matplotlib.axes._subplots.AxesSubplot at 0x7f551cbcbd10>
```



```
In [25]: # Figure of the histogramm of average rainfall per month
data_raw.sum(axis=1).plot.hist(title = 'Histogramm of total rainfall (mm) for each hydrological year')
```

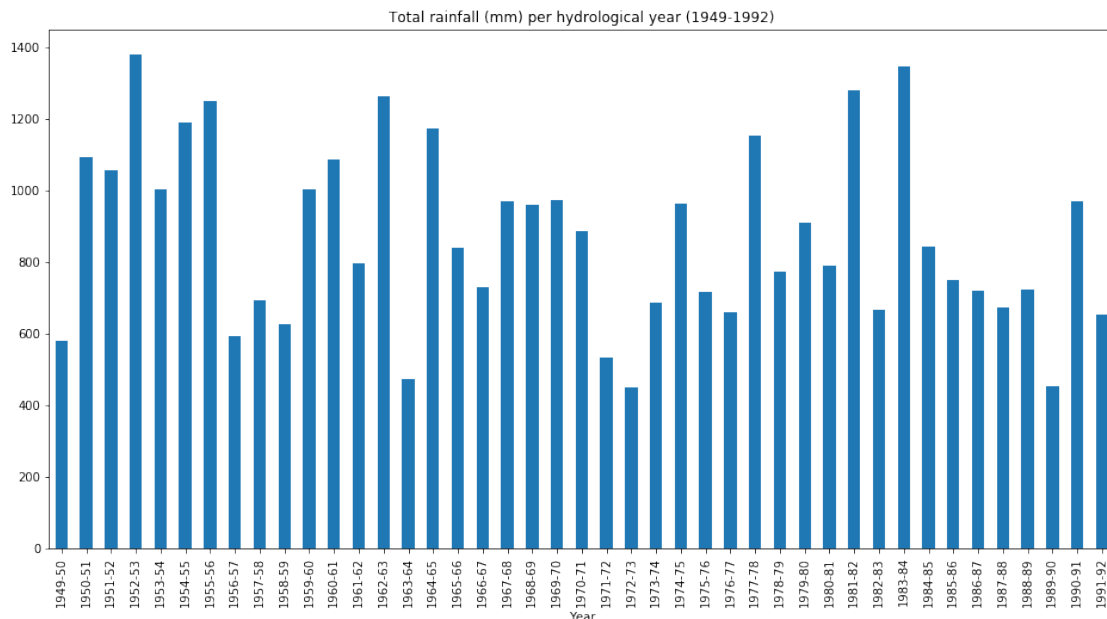
```
Out[25]: <matplotlib.axes._subplots.AxesSubplot at 0x7f551cbcb610>
```

Histogramm of total rainfall (mm) for each hydrological year (1949-1992)



```
In [27]: # Figure of the total value per hydrological year
data_raw.sum(axis=1).plot.bar(yerr=data_raw.std(),figsize=(16,8),title='Total rainfall per hydrological year')
```

```
Out[27]: <matplotlib.axes._subplots.AxesSubplot at 0x7f551ca5cb90>
```



1.0.1 We get the following data:

1.0.2 Max dry season = 450.1 mm at hydr. year 1972-73

1.0.3 Max wet season = 1381.1 mm at hydr. 1952-53

1.0.4 Statistics calculated from 43 hydrological years (mm)

Type

count
mean
std
min
25%
50%
75%
max
